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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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QUALCOMM INCORPORATED
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EXAMINER	
LAUTURE, JOSEPH J	

ART UNIT	PAPER NUMBER
2819	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	**Application No.**	**Applicant(s)**	
	10/715,572	IRVINE ET AL.	
	Examiner	**Art Unit**	
	JOSEPH LAUTURE	2819	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-16,18-36 and 38-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-16,18-36 and 38-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *082608*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Response to Amendments and Arguments

Applicant's amendment filed on 09/17/2008 has been entered.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

I The applicant argues that the Tong et al reference does not teach generating multiple descriptions of compressed data because the reference does not teach entropy encoding a second number of the layers using two different entropy coding processes wherein the layers are entropy coded separately, as disclosed in the amended claims.

In response, the examiner is citing a reference to Katto (US 5,657,085) wherein a two-dimensional wavelet transform coding method is disclosed. Katto teaches in figures (1B) and (3) a method for generating multiple descriptions of compressed data, the system including: a first entropy encoder (5) that codes a first number of the layers to generate a first description of compressed data; and a second entropy encoder (6) that codes a second number of the layers to generate a second description of compressed data.

II The applicant argues that the Tong reference does not teach grouping the transform coefficients into layers based on the energy distribution.

The examiner disagrees. This limitation of "grouping based on an energy distribution" is taught by both Tong et al and Katto. Tong et al teach (See abstract) hierarchically dividing an input data into a plurality of frequency bands using sub-band transforms. The division into the plurality of frequency bands refers to the energy distribution claimed by the applicant. The Katto reference also teaches grouping

transform coefficients into layers (See figure 1B) based on an energy distribution, i.e. from low frequency bands to higher frequency bands, the transform coefficients representing the energy of the pixel values in the frequency domain

III The applicant argues that the Tong reference does not teach extracting a first selected number of layers from the inventory based on a first bit rate requirement, and extracting a second selected number of layers from the inventory based on a second bit rate requirement, as claimed in the amended claims.

In response, the examiner is citing the Katto reference (US 5,657,085) to overcome the deficiencies of Tong et al, as compared with the amended claims. Katto teaches a coding system including: a first entropy encoder (5) that codes a first number of the layers to generate a first description of compressed data; and a second entropy encoder (6) that codes a second number of the layers to generate a second description of compressed data, and a multiplexer (7) that extracts 1) a first selected number of layers from one of two coding circuits (5), (6) to generate a first description of compressed data and 2) a second selected number of layers from one of two coding circuits (5), (6) to generate a second description of compressed data.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-24 and 31-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tong et al (US 5,982,434) in view of Katto (US 5,657,085).

Regarding claim 1, Tong et al teach in figure (1) a method for generating multiple descriptions of compressed data, the method comprising: generating transform coefficients from input data using a transformer (20); quantizing the transform coefficients using a quantizer (2); generating an energy distribution of the quantized transform coefficients, i.e. grouping the transform coefficients into frequency bands (See abstract); grouping the transform coefficients into layers based on the energy distribution i.e. hierarchically grouping the transform coefficients (See abstract); and using entropy coding also known as run length coding to encode a first number of layers by means of run length coder (4) to generate a first description of compressed data.

Tong et al do not teach a second encoder for entropy coding a second number of the layers to generate a second description of compressed data. Katto teaches in figures (3) and (1) a coding method including: entropy coding a first number of layers using a VLC encoder (5) to generate a first description of compressed data (note that VLC coding is one form of entropy coding); entropy coding a second number of the layers to generate a second description of compressed data using a VLC encoder (6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al and of Katto to realize an improved encoding system because that would improve coding performance by avoiding needless processing (See column 5, lines 46-49).

Regarding claim 12, Tong et al teach in figure (1) an apparatus for generating multiple descriptions of compressed data, the apparatus comprising: a transformer (20) for generating transform coefficients from input data; a quantizer (2) for quantizing the transform coefficients; means for generating an energy distribution of the quantized transform coefficients, i.e. for grouping the transform coefficients into frequency bands (See abstract); means for grouping the transform coefficients into layers based on the energy distribution i.e. for hierarchically grouping the transform coefficients (See abstract); and run length coder (4) also known as entropy coder to encode a first number of layers to generate a first description of compressed data.

Tong et al do not teach a second encoder for entropy coding a second number of the layers to generate a second description of compressed data. Katto teaches in figures (3) and (1) a coding method including: entropy coding a first number of layers using a VLC encoder (5) to generate a first description of compressed data (note that VLC coding is one form of entropy coding); entropy coding a second number of the layers to generate a second description of compressed data using a VLC encoder (6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al and of Katto to realize an improved encoding system because that would improve coding performance by avoiding needless processing (See column 5, lines 46-49).

Regarding claim 22, Tong et al teach in figure (1) an apparatus for generating multiple descriptions of compressed data, the apparatus comprising: a transform module (20) for generating transform coefficients from input data; a quantization module

(2) coupled to the transform module for quantizing the transform coefficients; inherent layering module for generating an energy distribution of the quantized transform coefficients, i.e. for grouping the transform coefficients into frequency bands (See abstract), the layering module being inherent since it is needed to group the coefficients based on energy distribution i.e. for hierarchically grouping the transform coefficients (See abstract; See column 5, lines 42-57 and column 6, lines 37-67); and a run length coder (4) also known as entropy coder to encode a first number of layers to generate a first description of compressed data.

Tong et al do not teach a second encoder for entropy coding a second number of the layers to generate a second description of compressed data. Katto teaches in figures (3) and (1) a coding method including: entropy coding a first number of layers using a VLC encoder (5) to generate a first description of compressed data (note that VLC coding is one form of entropy coding); entropy coding a second number of the layers to generate a second description of compressed data using a VLC encoder (6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al and of Katto to realize an improved encoding system because that would improve coding performance by avoiding needless processing (See column 5, lines 46-49).

Regarding claim 31, Tong et al teach in figures (5) and (6) a computer program product comprising: a computer readable medium including: code for generating transform coefficients from input data using a transformer (20); code for quantizing the transform coefficients using a quantizer (2); code for generating an energy distribution

of the quantized transform coefficients, i.e. grouping the transform coefficients into frequency bands (See abstract); code for grouping the transform coefficients into layers based on the energy distribution i.e. hierarchically grouping the transform coefficients (See abstract); and code for entropy coding also known as run length coding a first number of layers by means of run length coder (4) to generate a first description of compressed data.

Tong et al do not teach a second encoder for entropy coding a second number of the layers to generate a second description of compressed data. Katto teaches in figures (3) and (1) a coding method including: entropy coding a first number of layers using a VLC encoder (5) to generate a first description of compressed data (note that VLC coding is one form of entropy coding); entropy coding a second number of the layers to generate a second description of compressed data using a VLC encoder (6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al and of Katto to realize an improved encoding system because that would improve coding performance by avoiding needless processing (See column 5, lines 46-49).

Regarding claims 2-11, the combination of Tong et al and Katto teaches (See figures (1), (5), (6), (11) of Tong et al): a video encoding method that includes: grouping blocks of transform coefficients made of various numbers of bits including nibbles and crumbs into layers in an order of significance, i.e. according to their energy distribution (See abstract; `), wherein the quantized transform coefficients are arranged and stored in a memory (3) prior to generating the energy distribution, wherein the transform

coefficients are generated using discrete cosine transforms (See column 1, lines 36-39) and entropy encoding various subsequent layers to generate further compressed data that is stored in an inventory, wherein the layers are sequentially extracted for compression.

Regarding claims 13-21, 23 and 24, the combination of Tong et al and Katto teaches (See figures (1), (5), (6), (11) of Tong et a)l : a video encoding method that includes: grouping blocks of transform coefficients made of various numbers of bits including nibbles and crumbs into layers in an order of significance, i.e. according to their energy distribution (See abstract), wherein the quantized transform coefficients are arranged and stored in a memory (3) prior to generating the energy distribution, wherein the transform coefficients are generated using DCT/absolute transforms (See column 1, lines 36-39) and entropy encoding various subsequent layers to generate further compressed data that is stored in an inventory, wherein the layers are sequentially extracted for compression.

Regarding claims 32-41, the combination of Tong et al and Katto teaches (See figures (1), (5), (6) and (11) of Tong et al): a computer program product and method for video encoding, the computer program including codes for: grouping blocks of transform coefficients made of various numbers of bits including higher and lower nibbles and crumbs into layers in an order of significance, i.e. according to their energy distribution (See abstract), wherein the quantized transform coefficients are arranged and stored in a memory (3) prior to generating the energy distribution, wherein the transform coefficients are generated using DCT/absolute transforms (See column 1, lines 36-39)

and entropy encoding various subsequent layers to generate further compressed data that is stored in an inventory, wherein the layers are sequentially extracted for compression.

Claims 25-30 are rejected under 35 U.S.C 103(a) as being unpatentable over Tong et al (US 5,982,434) in view of Itawaki et al (US 2002/0085584) and further in view of Katto (US 5,657,085).

Regarding claim 25, Tong et al teach in figure (1) a method for generating compressed data based on quantized transform coefficients output from a quantizer (2), the method comprising: accessing an inventory of multiple layers of compressed data generated based on an energy distribution of the quantized transform coefficients (See abstract); and, extracting with a multiplexer (6) a selected number of layers from the inventory to generate the compressed data.

Tong et al do not specifically teach a method for generating compressed data wherein data is extracted based on a bit rate requirement. However, Itawaki et al teach in figure (4) a multiplex system for video encoding, wherein a multiplexing apparatus (6) extracts data based on a bit rate requirement (See figures (9), (10); See paragraph [0030]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al and of Itawaki et al to realize a system having improved performance and reliability because that would make it possible to transmit more programs (See paragraph [0006]).

The combination of Tong et al and Itawaki et al does not teach a second encoder for entropy coding a second number of the layers to generate a second description of

compressed data, and extracting a second selected number of the layers to generate a second description of compressed data. Katto teaches in figures (3) and (1) a coding method including: entropy coding a first number of layers using a VLC encoder (5) to generate a first description of compressed data (note that VLC coding is one form of entropy coding); entropy coding a second number of the layers to generate a second description of compressed data using a VLC encoder (6), and extracting a first selected number of layers and a second selected number of layers using a multiplexer (7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al , of Itawaki et al and of Katto to realize an improved encoding system because that would improve coding performance by avoiding needless processing (See column 5, lines 46-49).

Regarding claim 27, the combination of Tong et al and Itawaki et al teaches in figure (1) an apparatus for generating compressed data based on quantized transform coefficients output from a quantizer (2), the apparatus comprising: means for accessing an inventory of multiple layers of compressed data generated based on an energy distribution of the quantized transform coefficients (See abstract); and, a multiplexer (6) for extracting a selected number of layers from the inventory to generate the compressed data.

Tong et al do not specifically teach a method for generating compressed data wherein data is extracted based on a bit rate requirement. However, Itawaki et al teach in figure (4) a multiplex system for video encoding, wherein a multiplexing apparatus (6) extracts data based on a bit rate requirement (See figures (9), (10); See paragraph

[0030]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al and of Itawaki et al to realize a system having improved performance and reliability because that would make it possible to transmit more programs (See paragraph [0006]).

The combination of Tong et al and Itawaki et al does not teach a second encoder for entropy coding a second number of the layers to generate a second description of compressed data, and extracting a second selected number of the layers to generate a second description of compressed data. Katto teaches in figures (3) and (1) a coding method including: entropy coding a first number of layers using a VLC encoder (5) to generate a first description of compressed data (note that VLC coding is one form of entropy coding); entropy coding a second number of the layers to generate a second description of compressed data using a VLC encoder (6), and extracting a first selected number of layers and a second selected number of layers using a multiplexer (7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al , of Itawaki et al and of Katto to realize an enhanced encoding system because that would improve coding performance by avoiding needless processing (See column 5, lines 46-49).

Regarding claim 29, Tong et al teach in figure (1) an apparatus for generating compressed data based on quantized transform coefficients output from a quantizer (2), the apparatus comprising: a storage medium (3) configured to store an inventory of multiple layers of compressed data generated based on an energy distribution of the quantized transform coefficients (See abstract; See); and, a multiplexer (6) for

extracting a selected number of layers from the inventory to generate the compressed data.

Tong et al do not specifically teach a method for generating compressed data wherein data is extracted based on a bit rate requirement. However, Itawaki et al teach in figure (4) a multiplex system for video encoding, wherein a multiplexing apparatus (6) extracts data based on a bit rate requirement (See figures (9), (10); See paragraph [0030]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al and of Itawaki et al to realize a system having improved performance and reliability because that would make it possible to transmit more programs (See paragraph [0006]).

The combination of Tong et al and Itawaki et al does not teach a second encoder for entropy coding a second number of the layers to generate a second description of compressed data, and extracting a second selected number of the layers to generate a second description of compressed data. Katto teaches in figures (3) and (1) a coding method including: entropy coding a first number of layers using a VLC encoder (5) to generate a first description of compressed data (note that VLC coding is one form of entropy coding); entropy coding a second number of the layers to generate a second description of compressed data using a VLC encoder (6), and extracting a first selected number of layers and a second selected number of layers using a multiplexer (7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tong et al , of Itawaki et al and of Katto to realize an

enhanced encoding system because that would improve coding performance by avoiding needless processing (See column 5, lines 46-49).

Regarding claims 26, 28 and 30, the combination of Tong et al, of Itawaki et al and of Katto teaches (See figure 1 of Tong et al) a method for generating compressed data based on quantized transform coefficients (See abstract of Tong et al), the method including accessing a master inventory of multiple layers of compressed data stored in a memory (3), wherein the compressed data is generated based on energy distribution of the quantized transform coefficients (See abstract of Tong et al).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Lauture, whose telephone number is (571) 272-1805. The examiner can normally be reached Monday to Friday between 9:30 am and 6:00 PM

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford Barnie can be reached at (571) 272-7492. The fax number for the organization to which this application is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see ***http://pair-direct.uspto.gov.*** Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free). For assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joseph Lauture
Art Unit: 2819
Date: 12/23/2008

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